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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
KRASNIC, BERNARD	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/698,111	HARVILLE, MICHAEL
	Examiner	Art Unit
	Bernard Krasnic	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 8/23/2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The Request for Continued Examination filed 8/23/2007 have been entered and made of record.

2. The application has pending claims 1-40.

3. Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection because of the Request for Continued Examination (RCE).

4. Applicant's arguments filed 8/23/2007 have been fully considered but they are not persuasive.

The Applicant alleges, "For example, classifier 130 may be ..." in page 8, and states respectively that the independent claims 1, 23, and 32 each have been amended to include the limitation of where the classifier is used to "assign a class to said plan-view template" where a class is labeled as people reaching for items or people not reaching for items but standing still. The Applicant also states respectively that this amendment makes the instant claim limitations different from the prior art reference Carrot. However the Examiner disagrees because Carrot does disclose processing said plan-view template / entire slice (167, see Fig. 7) at a classifier / correlator (30, see Fig. 1) to assign a class / abnormalities such as suspect lesions to said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as

having a suspect lesion or not having a suspect lesion by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the class being labeled as people reaching for items or people not reaching for items but standing still) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant alleges, "Carrot does not disclose or suggest ..." in page 9, and states respectively that the prior art reference Carrot does not teach the amended claim limitation processing said plan view template at a classifier to assign a class to said plan-view template, wherein said classifier is trained to make a decision according to pre-configured parameters determined at least in part based on said class of said plan-view template as recited in claim 1. However the Examiner disagrees because Carrot does disclose processing said plan-view template / entire slice (167, see Fig. 7) at a classifier / correlator (30, see Fig. 1) to assign a class / abnormalities such as suspect lesions to said plan-view template wherein said classifier / correlator is trained / automated method to make a decision / suspect or not suspect lesion according to pre-configured parameters / library with defined pathological region data determined at least in part based on said class / abnormalities such as suspect lesions of said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as

having a suspect lesion or not having a suspect lesion by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions). Carrot also points to Zhang et al. (US 5,491,627) (see Carrot, col. 3,lines 33-43) to explain the automated methods to a further extent and therefore the Examiner will use the Zhang reference as a secondary reference as well to further teach this amended claim limitation to show that the classifier is actually trained to make a decision according to pre-configured parameters based at least in part on the class. Therefore claim 1 is still not in condition for allowance.

The Applicant alleges, "Carrot teaches comparing historical and later images ..." in page 9, "Carrot teaches partitioning ultrasonographic images ..." in page 9, and "The Office Action states in the first 4 lines of page 8 ..." in pages 9-10, and states respectively that *firstly* Carrot does not assign a class to slice 167 which represents the plan-view template because Carrot has no motivation to classify approximate shapes of slices or lumps. The Applicant states respectively that *secondly* Carrot's historical images and registered images are not plan-view because they are three-dimensional image representations. The Applicant states respectively that *thirdly* Carrot cannot provide "Discrimination between arm positions" such as people reaching their arms out for items or people not reaching their arms out for items but standing still. *Firstly*, the Examiner disagrees because as discussed above, Carrot does have motivation to classify abnormalities. *Secondly*, the Examiner disagrees because the slice 167 which represents the plan-view template is two-dimensional meaning it is plan view (see Carrot, col. 9, lines 22-23, *each slice is one* or more *layers of the three dimensional*

ultrasonorgraphic _image data_). _Thirdly_, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the class being labeled as people reaching for items or people not reaching for items but standing still) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant alleges, "For the foregoing reasons ..." in page 10, and states respectively that independent claim 23 should be patentable for similar reasons that claim 1 should be patentable. However the Examiner disagrees because claim 1 is still not in condition for allowance over the prior art as discussed above and therefore claim 23 similarly is not in condition for allowance over the prior art.

The Applicant alleges, "Claims 2-22 depend on independent Claim 1 ..." in pages 10-11 and states respectively that dependent claims 2-22 and claims 24-31 should be patentable for at least the reasons that their respective independent claims should be patentable. However the Examiner disagrees because as discussed above, independent claims 1 and 23 are still not in condition for allowance and therefore the claim rejections on dependent claims 2-22 and 24-31 are still maintained.

The Applicant alleges, "In paragraph 8, the Office Action rejected ..." in page 11 and "Applicant respectively agrees that Carrot ..." in page 11, and states respectively that independent claim 32 should be patentable over Carrot for similar reasons that claim 1 should be patentable over Carrot. However the Examiner disagrees because

claim 1 is still not in condition for allowance over the prior art as discussed above and therefore claim 32 similarly is not in condition for allowance over the prior art.

The Applicant alleges, "Claims 5, 7, and 8 ..." in page 11, and states respectively that dependent claims 5, 7, 8, 33, 35-37, 39, and 40 should be patentable for at least the reasons that their respective independent claims should be patentable. However the Examiner disagrees because as discussed above, independent claims 1 and 32 are still not in condition for allowance and therefore the claim rejections on dependent claims 5, 7, 8, 33, 35-37, 39, and 40 are still maintained. Therefore, all claims 1-40 are still not in condition for allowance. Further discussions will be discussed below.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 4, 6, 9, 11, 13-15, 18, 23, 24, 26, and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot et al (US 6909792 B1, as applied in previous Office Action) in view of Zhang et al (US 5,491,627).

Re Claim 1: Carrot discloses a method for visual-based recognition (see Abstract, lines 1, and 11-15) of an object / breast, said method comprising receiving depth data (see Fig. 7, col. 6, line 21, depth or z') for at least a pixel of an image of an object, said depth data comprising information relating to a distance from a visual sensor (see col. 6, lines

5-26, distance from the ultrasonic scanner [an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system] to the different parts of the breast tissue, col. 2, lines 41-44, col. 1, lines 25-28) to a portion of said object / breast shown at said pixel, said visual sensor / X-ray system comprising an emitter and sensor of light (see col. 2, lines 41-44, col. 1, lines 25-28, an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system, an X-ray system operates using emitters to emit x-ray light and light sensors to detect the light on the opposite end); generating a plan-view image / slice (167) (see Fig. 7, col. 9, lines 22-23, *each slice is one* or more *layers of the three dimensional* ultrasonorgraphic *image data, one layer of a three dimensional image is a slice or a two dimensional image plan view*) based in part on said depth data; extracting a plan-view template / entire slice (167) (see Fig. 7, the template may be the entire slice / plan-view image itself) from said plan-view image; and processing said plan-view template / entire slice (167, see Fig. 7) at a classifier / correlator (30) (see Fig. 1, col. 2 line 45-47) to assign a class / abnormalities such as suspect lesions to said plan-view template; wherein said classifier / correlator is trained / automated method to make a decision / suspect or not suspect lesion according to pre-configured parameters / library with defined pathological region data determined at least in part based on said class / abnormalities such as suspect lesions of said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as having a suspect lesion or not having a suspect lesion

by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions).

However, Carrot fails to specifically suggest how the classifier is actually trained to make a decision.

Zhang discloses that the classifier / neural network is trained to make a decision / positive or negative detections (see Zhang, col. 1, lines 52-58, the neural network is trained to output either a positive detection of a micro-calcification on the mammogram or a negative detection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Carrot's method using Zhang's teachings by including a neural network type system to Carrot's abnormality classifier in order to improve the classification by reducing the false-positive detections by limiting the detection to either a positive detection of an abnormality within the mammogram image or a negative detection (see Zhang, col. 1, lines 52-58).

Re Claim 2: Carrot further discloses receiving non-depth data / color (see col. 2, line 57, multicolor imagery) for said pixel.

Re Claim 4: Carrot further discloses selecting a subset / ROI of said depth data / multicolored data based on foreground segmentation / thresholding multicolored data (see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 6: Carrot further discloses receiving non-depth data / multicolored data for said pixel, and wherein said foreground segmentation / thresholding multicolored data is based at least in part on said non-depth data (see col. 1, lines 64-66, Abstract, lines 13-15, thresholding on ROI colored image, col. 3, lines 58-60).

Re Claim 9: Carrot further discloses extracting said plan-view template from said plan-view image is based at least in part on object tracking / ROI (see col. 3, lines 25-36 and 40-43, tracking ROI).

Re Claims 11: Carrot further discloses said plan-view image is based in part on said non-depth data (see col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 13: Carrot further discloses said plan-view image comprises a value based at least in part on an estimate of height / depth z' of a portion of said object / breast above a surface /pressure plate (83, 84) (see Fig. 3, col. 5, lines 59-61, the depth is considered as an estimate of height a result of the breast being on a pressure plate).

Re Claim 14: Carrot further discloses said plan-view image comprises a value based at least in part on color data for a portion of said object (see Abstract, lines 13-15, col. 1, lines 64-65, col. 3, lines 4-8, col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 15: Carrot further discloses said plan-view image comprises a value based at least in part on a count of pixels / ROI obtained by said visual sensor and associated with said object (see col. 3, lines 27-44, col. 4, lines 26-28, ROI has a certain amount or count of pixels).

Re Claim 18: Carrot further discloses performing height normalization / depth z' based on pressure plate (83, 84) on said plan-view template / slice (167) (see Figs. 3 and 7, col. 5, lines 59-61, the depth is considered as a height normalization as a result of the breast being on a pressure plate, the three dimensional image is therefore dependent upon the height normalization and therefore each template or slice is dependent upon the height normalization).

Re Claim 23: Carrot discloses a visual-based recognition system comprising a visual sensor (20) (see Fig. 1, col. 2, lines 41-45, Abstract, lines 1, and 11-15) for capturing depth data (see Fig. 7, col. 6, line 21, depth or z') for at least a pixel of an image of an object / breast, said depth data comprising information relating to a distance from said visual sensor (see col. 6, lines 5-26, distance from the ultrasonic scanner [an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system] to the different parts of the breast tissue, col. 2, lines 41-44, col. 1, lines 25-28) to a portion of said object visible at said pixel, said visual sensor / X-ray system comprising an emitter and sensor of light (see col. 2, lines 41-44, col. 1, lines 25-28, an ultrasonographic imaging system or its

equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system, an X-ray system operates using emitters to emit x-ray light and light sensors to detect the light on the opposite end); a plan-view image generator (20,24) for generating a plan-view image / slice (167) (see Fig. 7, col. 9, lines 22-23, *each slice is one* or more *layers of the three dimensional* ultrasonorgraphic *image data, one layer of a three dimensional image is a slice or a two dimensional image plan view*) based on said depth data; a plan-view template generator (20,24) for generating a plan-view template / slice (167) (see Fig. 7, the template may be the entire slice / plan-view image itself) based on said plan-view image; and a classifier / correlator (30) (see Fig. 1, col. 2 line 45-47) for making a decision concerning recognition / suspect or not suspect lesion of said object, wherein said classifier / correlator is trained / automated method to make said decision according to pre-configured parameters / library with defined pathological region data that were determined at least in part based on a class / abnormalities such as suspect lesions assigned to said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as having a suspect lesion or not having a suspect lesion by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions).

However, Carrot fails to specifically suggest how the classifier is actually trained to make a decision.

Zhang discloses that the classifier / neural network is trained to make a decision / positive or negative detections (see Zhang, col. 1, lines 52-58, the neural network is

trained to output either a positive detection of a micro-calcification on the mammogram or a negative detection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Carrot's system using Zhang's teachings by including a neural network type system to Carrot's abnormality classifier in order to improve the classification by reducing the false-positive detections by limiting the detection to either a positive detection of an abnormality within the mammogram image or a negative detection (see Zhang, col. 1, lines 52-58).

Re Claim 24: Carrot further discloses said visual sensor is also for capturing non-depth data / color (see col. 2, line 57, multicolor imagery).

Re Claim 26: Carrot further discloses a pixel subset selector (52, 24) for selecting a subset / ROI of pixels of said image, wherein said pixel subset selector is operable to select said subset of pixels based on foreground segmentation / thresholding multicolored data (see Figs. 1 and 2a, see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 28: Carrot further discloses said plan-view image is based in part on said non-depth data (see col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 29: Carrot further discloses to generate a three-dimensional point cloud / three dimensional data set based on said depth data / direction z', wherein a point of said three-dimensional point cloud comprises a three-dimensional coordinate / x', y', z' (see Fig. 7, col. 3, lines 4-7, col. 6, lines 20-21).

Re Claim 30: Carrot further discloses to divide said three-dimensional point cloud / three dimensional data set into a plurality of slices such that a plan-view image (167) may be generated for at least one slice of said plurality of slices (see Fig. 7, col. 3, lines 4-7, col. 9, lines 16-27).

Re Claim 31: Carrot further discloses to extract a plan-view template / slice (167) from at least two plan-view images / plurality of slices corresponding to different slices of said plurality of slices, wherein said plan-view template comprises a transformation / summing data points of at least a portion of said plan-view images / entire slice, such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

7. Claims 5, 7, 8, 32, 33, 35-37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot, as modified by Zhang, as applied to claims 1 and 23 above. The teachings of Carrot as modified by Zhang have been discussed above.

Re Claim 5 and 32 respectively: Carrot, as recited in claim 5, further discloses generating a three-dimensional point cloud / three dimensional data set of said subset /

ROI of pixels based on said depth data / direction z' (col. 3, lines 27-37 and 40-43, col. 6, lines 20-21), wherein a point of said three-dimensional point cloud comprises a three-dimensional coordinate / x', y', z' (see Fig. 7, col. 3, lines 4-7); partitioning said three-dimensional point cloud into a plurality of vertically oriented bins; and mapping at least a portion of points of said plurality of vertically oriented bins into at least one said plan-view image / ROI or slice addition based on said three- dimensional coordinates, wherein said plan-view image is a two-dimensional representation / slice of said three-dimensional point cloud comprising at least one pixel corresponding to at least one vertically oriented bin of said plurality of vertically oriented bins (see col. 3, lines 27-37 and 40-43, ROI may cover these vertical bins, col. 9, lines 22-26, addition of all the possible slices will then cover all the bins).

Although the partitioning step of Carrot's three dimensional cloud is not specifically disclosed, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature where the vertical bin is each depth or z' axis point, so for example, if the point [x',y'] is looked at, all the same points [x',y'] along the different z' values creates a vertical bin.

As to claim 32, all the limitations are taught by Carrot and Zhang in the same manner as Carrot and Zhang taught claims 1, 5, and 6 respectively above.

Re Claim 7: Carrot further discloses dividing said three-dimensional point cloud into a plurality of slices (164, 167), and wherein said generating said plan-view image / slice

(167) is performed for at least one slice of said plurality of slices (see Fig. 7, col. 3, lines 4-7).

Re Claim 8: Carrot further discloses extracting a plan view template / slice (167) from at least two plan-view images / plurality of slices corresponding to different slices of said plurality of slices, wherein said plan-view template comprises a transformation / summing data points of at least a portion of said plan-view images / entire slice, such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 33: Carrot further discloses said three-dimensional point cloud / three dimensional data set and said plan-view image / entire slice (167) are also based at least in part on non-depth data / multicolored data (see Fig. 7, col. 1, lines 64-65, col. 3, lines 4-7, Abstract, lines 11-15).

Re Claim 35: Carrot further discloses wherein said plan view template comprises a transformation / summing data points of at least a portion of said plan view image / entire slice (167), and such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 36: Carrot further discloses dividing said three-dimensional point cloud / three dimensional data set of into a plurality of slices, and wherein said mapping / summing

data points at least a portion of points comprises mapping points within a slice of said plurality of slices of said three-dimensional point cloud into said plan-view image / slice (see col. 3, lines 4-7, col. 9, lines 22-27).

Re Claim 37: Carrot further discloses wherein said plan view template comprises a transformation / summing data points of at least a portion of said plan view image / entire slice (167), such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 39: Carrot further discloses said plan-view image / slice is generated from a subset / ROI of pixels of said image selected based on foreground segmentation / thresholding multicolored data (see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 40: Carrot further discloses extracting a plan view template / entire slice (167) from at least two plan view images corresponding to different slices of said plurality of slices, wherein said plan view template comprises a transformation / summing of data points of at least a portion of said plan view images / entire slice (167), such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

8. Claims 3, 10, 12, 16, 17, 19-22, 25, 27, 34, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot, as modified by Zhang, as applied to claims 1, 23 and 32 above, and further in view of Li et al (US 2003/0108244 A1, as applied in previous Office Action). The teachings of Carrot as modified by Zhang have been discussed above.

However, Carrot as modified by Zhang, fails to teach of fairly suggest depth data is determined by stereopsis, that the classifier is a support vector machine, that the plan-view template is a vector basis obtained by principal component analysis (PCA), and that a decision is to distinguish between a human, non-human, and different bodies.

Li, <u>as recited in claim 3 and claim 34 respectively</u>, discloses said depth data using stereopsis / one or more cameras based on image correspondences (see page 6, right col., line 7).

Li, <u>as recited in claim 10</u>, discloses said classifier is a support vector machine / SVM's (see page 1, paragraph [0008], lines 18-24, slices or plan-view image will be affected by SVM's).

Li, <u>as recited in claim 12</u>, discloses said object is a person (see page 1, paragraph [0005], lines 17-19, paragraph [0007], last two lines, "face and non-face classification").

Li, <u>as recited in claim 16</u>, discloses Re Claim 16: The method as recited in Claim 1 wherein said plan-view template is represented in terms of a vector basis / SVM's (see page 1, paragraph [0008], lines 18-24, since slices or plan-view image will be affected by SVM's, so will the templates since the template is the entire slice).

Li, as recited in claim 17, discloses said vector basis is obtained through principal component analysis (PCA) (see page 1, paragraph [0008], lines 18-24, "PCA as they rotate and use the SVM's").

Li, as recited in claim 19, discloses said decision is to distinguish between a human and a non-human (see page 1, paragraph [0005], lines 17-19, paragraph [0007], last two lines, "face and non-face classification").

Li, as recited in claim 20, discloses said decision is to distinguish between a plurality of different human body orientations (see page 2, paragraph [0016], page 4, paragraph [0039], lines 13-15, classes of view ranges being left profile, left half profile, frontal, etc.).

Li, as recited in claim 21, discloses said decision is to distinguish between a plurality of different human body poses / face poses (see page 7, paragraph [0073], last two lines, page 4, paragraph [0039], lines 13-15).

Li, as recited in claim 22, discloses said decision is to distinguish between a plurality of different classes / position of people (see page 2, paragraph [0016], page 4, paragraph [0039], lines 13-15, "classes of view ranges").

Li, as recited in claim 25, discloses said visual sensor determines said depth data using stereopsis / one or more cameras based on image correspondences (see page 6, right col., line 7).

Li, as recited in claim 27 and claim 38 respectively, discloses said classifier is a support vector machine / SVM's (see page 1, paragraph [0008], lines 18-24, "PCA as they rotate and use the SVM's for multi-pose face detection").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Carrot's visual-based recognition method and system, as modified by Zhang, using Li's teachings by including the capabilities of stereopsis for determining depth data, the classifier being a support vector machine, the plan-view template being a vector basis obtained by principal component analysis (PCA), and a decision by the classifier being to distinguish between a human, non-human, and different bodies, to the receiving depth data and processing the plan-view template steps of Carrot in order to detect a person's face in real time, in input images containing either frontal or non-frontal views regardless of the scale or illumination conditions associated with the face.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-4:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
November 8, 2007

JINGGE WU
SUPERVISORY PATENT EXAMINER